MEDICAL PRACTICE

*Outside Europe***Histopathology services for developing countries**

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In most developing countries, particularly those in the tropics with a predominantly rural population, the provision of diagnostic pathology services lags behind the development of clinical resources. During the past 30 years many schemes have been devised to provide adequate and appropriate laboratory services for the different needs of rural dispensaries and health centres, small district hospitals, and regional hospitals. Appropriate technology is vital to such plans, and the World Health Organisation and other individuals have produced several valuable manuals to this end. For most of these countries, however, diagnostic histopathology services are centred on the capital or other large cities, usually in the medical school. Worthy attempts to establish histological work in small hospitals usually fail after a period of initial enthusiasm.

The paucity of trained pathologists in regions such as sub-Saharan Africa was emphasised to one of the authors (MSRH) when, in his second year as professor of pathology (1963) at Makerere University, Uganda, he received a document from an international organisation asking for a list of pathologists with specialty training in oncology in Uganda. A generous estimate disclosed that within the whole area south of Sahara, but including Ethiopia, and north of the Zambezi river, there were then 12 fully qualified pathologists. With the development of medical schools in Africa and in other parts of the tropical world, more departments of pathology were established, most of which began to provide services to all government and mission hospitals in the country.

In Uganda the biopsy rates increased from 3400 in 1962 to over 12 000 in 1970, a large part of this increase being due to the reception of more specimens from "up country." Nevertheless,

in many areas services are still seriously deficient. In such circumstances a postal service to a large centre outside the country may be valuable on a temporary basis,¹ and several of our colleagues in Britain continue to service mission hospitals in the tropics.

In 1966 Dr J Borgstein, the senior government surgeon, approached Professor George Cunningham at the Royal College of Surgeons in London to see whether he would provide a temporary postal histopathology service to Malawi, as the only histopathologist in Malawi was leaving. In 1968, on Professor Cunningham's appointment to a chair in the United States, the service was taken over by one of us (HS) in the department of morbid anatomy, St Thomas's Hospital Medical School. About this time arrangements were being made for Professor Hutt to be appointed "professor of geographical pathology" in the school (1970), an appointment supported by the Wellcome Trust. All diagnostic pathology for Malawi has been done in the department at St Thomas's since that time. During the past 12 years a constant service has also been provided for mission hospitals in eastern Zaire, the Ivory Coast, and Sierra Leone. Specimens have also been received on a less regular basis from Cambodia, Fiji, the Comoro Islands, and the Yemen. In undertaking this work for developing countries we have had three objectives.

Provision of diagnostic services

In the first place the service for Malawi was established to help an independent developing country with strong British links with a very important part of its health service that could not be provided locally. This role has always been a predominant one in our minds, and we would regard it as an important part of overseas aid. Despite the limitations placed by the logistics all the evidence is that the service has been greatly appreciated by the Ministry of Health and doctors in Malawi. Even if reports sometimes come too late for the immediate management of a

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patient, they are important for clinical diagnostic quality control and, for those working in remote areas, as a form of contact with the wider medical world. Throughout the time that these services have been undertaken, our basic aim was to find and train Malawian pathologists and technologists so that all histopathology can be done locally. By the end of 1982 the first fully qualified histopathologist and a skilled technologist will have returned from this department to establish, with the aid of two European pathologists, a countrywide service for the whole of Malawi.

Postgraduate education

The addition of 4000 specimens a year from Africa has greatly extended the range of experience of our own postgraduates training in histopathology, as well as supplying "appropriate" material for the large number of trainee pathologists from overseas who have passed through the department of histopathology during the past 12 years. These include pathologists from Burma, Hong Kong, Malaysia, Singapore, Pakistan, Iraq, Iran, Kenya, Uganda, Malawi, Nigeria, Sudan, Egypt, and Venezuela.

Although experience in "tropical pathology" such as the diagnosis of leprosy, schistosomiasis, mycetoma, etc, is a valuable part of the extra experience acquired through involvement of trainees in the service, the extended range of diagnostic pathology provided by a different geographical environment and by non-selection of material is equally important. This material has also proved valuable in providing tropical histopathology slide seminars for the Association of Clinical Pathologists and other groups.

Research

The delineation of disease patterns, both of infective and non-infective conditions in Africa, is still far from complete. While it is possible to make certain generalisations about such patterns in sub-Saharan Africa, it is the variability of disease frequency between and within countries that has proved to be the starting point of so many fascinating aetiological discoveries, such as Burkitt's lymphoma and tropical splenomegaly. Before 1968 little information was available about the disease pattern in Malawi apart from that derived from the work of those concerned with the most important infectious diseases of the continent, such as malaria, schistosomiasis, and leprosy.

During the 12 years, we have used this service to extend the knowledge of the pattern of both infectious and non-infectious diseases and, where appropriate, and in conjunction with other workers, to add to the overall knowledge of the aetiology and pathology of some of these conditions.

Materials and methods

All biopsy and surgically removed specimens in government and mission hospitals throughout Malawi are fixed in 10% formol saline. With large specimens appropriate pieces of the lesion are taken for processing. After initial fixation the specimens are sent to the central pathology laboratory at Blantyre, where they are registered and given an identification number. They are then transferred to polyethylene containers with a small quantity of fixative and sealed. The "fingers" of rubber gloves make a useful and light alternative for transport of specimens.

The plastic containers, currently about 80-90 a week, are then flown from Blantyre to Heathrow Airport for onward transmission to St Thomas's Hospital; they are then cut up and processed in a routine manner. When things go smoothly specimens sent on a Friday flight from Blantyre should be processed and reported on by the following Thursday. Reports are routinely sent by air mail but in urgent cases cable or telex is used. Although the delay period is unsatisfactory, it should be borne in mind that in most rural tropical countries the major delay in reporting histology is the transport of the specimen to the

central laboratory and of the report back to the periphery. Discussions with doctors working in rural areas of Malawi suggest that the service they receive is as satisfactory as those working in similar areas in nearby countries. Financial help to run the service has been received from the Malawi government, the Wellcome Trust, and the Overseas Development Agency.

Diagnostic patterns

In 1981 we received 4770 biopsies or surgical specimens from Africa. The histopathological diagnoses on 1000 consecutive specimens from Malawi have been analysed as part of a larger review of material received from Britain. Two hundred and fifty (25%) were malignant tumours. Carcinoma of the cervix accounted for 26% of all cancers; malignant skin tumours—predominantly squamous-cell carcinomas arising in tropical ulcer scars—for 11.4%; bladder cancer, often associated with *Schistosoma haematobium* infection, for 7.2%, and soft-tissue sarcomas, particularly Kaposi's sarcoma in men, for 6.0%. Other tumours common in Africa but rare in the United Kingdom included Burkitt's lymphoma (2), choriocarcinoma (6), and conjunctival carcinoma (4).

A common cause of morbidity in women in Africa is chronic pelvic sepsis. Of 245 diagnostic curettings (6.3% of all specimens) 25% showed non-specific chronic endometritis and 2.1% were cases of chronic salpingitis or salpingo-oophoritis. Tuberculosis, most frequently affecting lymph nodes, but also the peritoneum, endometrium, Fallopian tubes, bones and joints, and epididymis was diagnosed in 3.1% of all biopsy specimens. Both *S. haematobium* and *S. mansoni* have a high prevalence in Malawi. Most of the biopsy-diagnosed cases (2.9% of all specimens) were *S. haematobium* infections of the bladder or female genital tract. Other diagnoses in these 1000 specimens included onchocerciasis, leprosy, mycetoma, and rhinosporidiosis.

During the past eight years the collected histopathological material has been used for several specific clinicopathological investigations. These include studies on infectious diseases—rhinoscleroma,² aspergilloma of the paranasal sinuses,³ schistosomiasis,⁴ hepatitis B infection,⁵ visceral leishmaniasis,⁶ and female genital tuberculosis⁷; on disease of uncertain aetiology—tumoral calcinosis⁸ and fibroid polyps of the small bowel⁹; on tumours—Kaposi's sarcoma,¹⁰⁻¹² salivary gland tumours,¹³ bladder cancer,^{14,15} multiple myelomatosis,¹⁶ cervical cancer,¹⁷ conjunctival cancer,¹⁸ and histiocytic medullary reticulosis.¹⁹

Conclusions

At a time when British contributions to tropical medicine are being scrutinised both by politicians and by those who have long been concerned with the medical problems of developing countries, we think that there is a continuing need for us to retain our competence in the diagnostic aspects of tropical and geographical medicine as part of the total British effort in this field. The information gained by good histopathology services has been vital in initiating many of the remarkable scientific discoveries that have had their roots in the tropics. While many countries are now self-sufficient in this field many more will be short of diagnostic pathology services for years to come.

The establishment and maintenance of this service would not have been possible without the financial help and encouragement of the Wellcome Trust, in particular with their help in establishing a geographical pathology unit in the department of histopathology at St Thomas's Hospital Medical School. Financial aid for this service has also come from the Malawi Government, the Overseas Development Agency, a Wellcome Trust grant, and the special trustees of St Thomas's Hospital. The British Council has provided training grants for Dr G Liomba and Mr H Mwafurirwa.

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References

- ¹ Penman HG. Tropical pathology by post: a Fijian experience. *NZ Med J* 1971;**73**:83-5.
- ² Liomba NG, Hutt MSR. Rhinoscleroma in Malawi and Eastern Zaire. *J Trop Med Hyg* 1980;**83**:187-90.
- ³ Liomba G, Hutt MSR. Aspergillus granuloma of the paranasal sinuses and bronchi in Malawi. *Trop Geogr Med* 1981;**33**:169-74.
- ⁴ Molyneux ME, Hutt MSR, Clear AS, Bartlett A. Serum immunoglobulin concentrations, malarial and schistosomal antibodies in patients with massive splenomegaly in Malawi. *J Trop Med Hyg* 1979;**84**:183-7.
- ⁵ Molyneux ME, Supran EM, Islam MN, Banatvala JE, Hutt MSR. Hepatitis-B viral determinants in patients with liver disease in Malawi. *Trans R Soc Trop Med Hyg* 1980;**74**:383-8.
- ⁶ Knowles JK, Paul B, Hutt MSR, Lucas S. A case of visceral leishmaniasis in Malawi. *Trans R Soc Trop Med Hyg* 1981;**75**:474-5.
- ⁷ Liomba NG, Chipangwi JD. Female genital tuberculosis in Malawi—a report of 90 cases. *Journal of Obstetrics and Gynaecology in East Central Africa* 1982;**1**:69-72.
- ⁸ Liomba NG, McKee PH, Hutt MSR. Tumoral calcinosis. *Journal of the Medical Association of Malawi* 1982;**II**:5-6.
- ⁹ Nkanza NK, King M, Hutt MSR. Intussusception due to inflammatory fibroid polyps of the ileum: a report of 12 cases from Africa. *Br J Surg* 1980;**67**:271-4.
- ¹⁰ O'Connell KM. Kaposi's sarcoma: histopathological study of 159 cases from Malawi. *J Clin Pathol* 1977;**30**:687-95.
- ¹¹ O'Connell KM. Kaposi's sarcoma in lymph nodes; histological study of lesions from 16 cases in Malawi. *J Clin Pathol* 1977;**30**:696-703.
- ¹² O'Connell KM, Borgstein J, Hutt MSR. Kaposi's sarcoma in Malawi. Clinicopathological features. *East African Journal of Medical Science* 1977;**4**:59-63.
- ¹³ Thomas KM, Hutt MSR, Borgstein J. Salivary gland tumours in Malawi. *Cancer* 1980;**46**:2328-34.
- ¹⁴ Lucas SB. Carcinoma of the bladder and schistosomiasis in Malawi. *Proceedings of the Association of Surgeons in East Africa* 1981;**4**:234-8.
- ¹⁵ Lucas SB. Bladder tumours in Malawi. *Br J Urol* (in press).
- ¹⁶ Tozer RA, Clear AS, Davies DR, Hutt MSR. Unusual presentation of patients with myelomatosis in Malawi. *J Clin Pathol* 1980;**33**:544-6.
- ¹⁷ Lowe D, Jorizzo J, Chipangwi J, Hutt MSR. Cervical carcinoma in Malawi; a histopathologic study of 460 cases. *Cancer* 1981;**47**:2493-5.
- ¹⁸ Clear AS, Chirambo MC, Hutt MSR. Solar keratosis, pterygium and squamous cell carcinoma of the conjunctiva in Malawi. *Br J Ophthalmol* 1979;**63**:102-9.
- ¹⁹ Molyneux MG, Tozer RA, Hutt MSR. Histiocytic medullary reticulosis in Africa. *Lancet* 1978;**ii**:1202-3.

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Essentials of Health Economics

Part III (continued)—Developing health care policies

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If the National Health Service is to consider broad objectives in its health care planning then cost and outcome data should be assembled in a form best suited to such consideration. In health care priorities are often thought of in terms of the elderly, the mentally ill, and the acute sector. Why not then produce data which will allow consideration, no matter how crudely, of what is being spent on these different client groups and what is being obtained for the money?

Programme budgeting

This was the thinking underlying the programme budgets presented by the economists at the Department of Health and Social Security in 1976.¹ These analyses were used to indicate what was then currently being spent and achieved. Furthermore, the plotting of previous years' expenditure could indicate which programmes had been growing at what rate and, perhaps most

important of all, provide information on where the NHS should be heading in future. The logic of this simple approach of bringing together cost and output data to help assess priorities would seem difficult to deny, bearing in mind as always that costs here are forgone benefits. It is an explicit recognition of what most NHS personnel would accept implicitly—that an important goal of health care is to try to maximise the benefit from the limited resources available. Economists are thus not the desiccated calculating machines of Nye Bevan's portrayal. They are not attempting to remove the need for value judgments or even emotionalism in health care but are trying to provide a framework within which these can be articulated constructively.

One interesting extension of this approach is to look explicitly at the margins of future expenditure, because it is here that priorities genuinely apply. "Higher priority" for the elderly as opposed to the acute sector clearly does not mean that all aspects of care of the elderly have priority over all aspects of acute care. Fortunately, the issue is much simpler: is the marginal resource better spent on the elderly or the acute sector? is the community overall better off if a little less is spent on the acute sector and a little more on the elderly? Acceptance of this marginal approach led the Scots (so often in the van) in their latest priorities document² to consider different possible future growth rates so that their priorities were set out in terms of different recommendations given—that is, no growth, 1½% a year, and 3% a year. This is economic planning, an acceptance that priorities are a relative marginal concept and are equally determined by benefits and costs. Three examples of different forms of programme budgeting at different levels are

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